9 STORMWATER MANAGEMENT

The following information is provided in accordance with the City of Portland Code of Ordinances Chapter 14 Land Use, Section 14-526(b)(3).

9.1 OVERVIEW

Maine Workforce Housing, LLC intends to redevelop two parcels totaling 16,553 square feet at 178 Kennebec Street in Portland. The project will result in a small decrease in impervious area. This narrative describes the stormwater runoff patterns and methods of stormwater management for the existing (pre-development) and proposed (post-development) conditions.

9.2 EXISTING CONDITIONS

The existing project site is entirely developed and relatively flat. The site contains approximately 14,842 square feet of compacted gravel surface area and is currently used for vehicle parking. The existing site features no formal stormwater management infrastructure. Runoff currently drains overland from the center of the parcel in all directions. Localized ponding occurs due to uneven grading of the gravel lot. Runoff flows to the existing stormdrain networks in Kennebec, Brattle and Parris Streets.

9.3 PROPOSED PROEJCT

The proposed project includes construction of a 7-story building with a footprint of 6,667 square feet, a 19-space parking lot, and associated sidewalks, utilities, and landscaping. Because the majority of the existing site is covered in impervious surface, the project will result in a decrease of approximately 85 square feet of impervious area, leaving a total impervious surface area of 14,757 square feet. The total proposed non-roof impervious area is 8,096 square feet.

Because impervious surface area will be reduced, the project is not required to meet the General or Flooding Standards. Redevelopment of non-roof impervious area is greater than 5,000 square feet, so the City's redevelopment standards apply to the project. The redevelopment standards require treatment of stormwater runoff from 50% of the proposed total impervious areas based on MDEP's pollutant ranking system for redevelopment projects:

Existing Impervious: Gravel Parking Lot
Area = 14,842 sf
Pollutant Ranking = 3

Proposed Impervious: Flat roof and paved parking & sidewalk
Area = 14,757 sf
Pollutant Ranking = 3 (for both cover types)

Ranked Impact Change due to the Redevelopment = 0

Percentage of Impervious Area that must be treated = 50%
Impervious Area that must be treated = 7,379 sf

9.4 TREATMENT MEASURES

Proposed treatment measures designed to meet the treatment standards include a roof drain filter unit and permeable pavers. More information for each system is provided below.

Roof Runoff Filter

Runoff from a portion of the roof will be captured in a roof drain system and directed to a storm basin filter system that utilizes cartridge filters installed within the building. The storm filter unit is manufactured by Fabco Industries, and has been used on other urban infill projects in the city where there is limited area outside the building for more typical stormwater treatment measures. A detail of the unit is provided on Sheet C-6.1, and sizing calculations are provided in Attachment 9-A.

Approximately 68% of the proposed roof area (4,520 sf) will be collected and treated in the storm basin filter prior to discharging to the existing storm drain network in Parris Street. The system was designed with the capacity to filter up to a 1-year storm event. More intense rainfall events will partially bypass the filters.

The remaining roof runoff will be untreated but captured in a separate roof drain system and discharged to the existing storm drain network in Brattle Street.

Pervious Pavers

A single row of parking, containing 12 parking spaces, located on the south side of the building will be constructed using pervious pavers. Beneath the pavers, a crushed stone reservoir course will store runoff before it is filtered through a gravel subbase material and collected in a perforated underdrain. The underdrain system will connect to an existing storm drain in Parris Street. The system will receive runoff from 2,859 square feet of parking and the adjacent sidewalk area.

An additional benefit of the pervious pavers is that some runoff is expected to infiltrate into the subgrade beneath the underdrain system, reducing the volume of runoff that will be directed to the city's storm drain network.
Runoff from the remaining parking lot and sidewalk areas not tributary to the pervious pavers will continue to flow overland towards the surrounding streets and existing storm drain networks, as it does today.

9.5 CONCLUSIONS

The design meets the treatment standards for redevelopment projects, outlined in Section 5.2.D of the City of Portland Technical Manual. The roof drain filter and pervious paver system will treat 7,379 square feet of impervious area, which equals 50% of the proposed impervious surface on the site.

The project is also expected to result in a modest decrease in runoff volume due to the reduction in impervious surface area and the infiltration that is expected to occur within the pervious pavement system.

The project is not expected to cause ponding, flooding, or erosion problems on or downstream of the site. The relatively small amount of runoff entering the city's storm drain network is not expected to overburden the system.

9.6 ATTACHMENTS

Attachment 9-A – Roof Drain Filter Design Calculations

ATTACHMENT 9-A

Roof Drain Filter Design Calculations

DOWNSPOUT FILTER SIZING CALCULATIONS

1. Calculate Peak Flow Rate During 1-year Storm

Method: Rational Formula (Q=ciA)

c= 0.95
I (in/hr)= 3.06 1-year storm, Tc=5 min.
A (sf)= 4,520

Q_1 (cfs)= 0.302

2. Calculate How Many Filter Cartridges are Necessary

Q, Flow Rate per Cartridge (cfs)= 0.25

Cartridges = Q_1 / Q = 1.2

2 Cartridges

3. Confirm Bypass Flow Rate is Adequate

Bypass Flow Rate=1.0 cfs

Calculate Peak Flow Rate During 100-year storm:

Method: Rational Formula (Q=ciA)

c= 0.95
I (in/hr)= 8.82 100-year storm, Tc=5 min.
A (sf)= 4,520

Q_{100} (cfs)= 0.869